

AMENDMENTS TO CLAIMS

1-11. (Canceled)

12. (Original) A mask for forming a contact hole with a depth of focus of at least 0.4 μm , said mask comprising:
a first layer of material; and
a second layer of attenuating phase shifting material; and
wherein said first layer of material and said second layer of attenuating phase shifting material are patterned to form a transparent opening, a partially transmissive rim surrounding said opening, and sub-resolution assist features for preventing incident light from propagating through portions of said attenuating phase shifting material.

13. (Original) The mask of claim 12, wherein said partially transmissive rim is arranged to phase shift said incident light by 180° or an odd multiple of 180° .

14. (Original) The mask of claim 13, wherein said sub-resolution assist features form polygonal corners on said partially transmissive rim.

15. (Original) The mask of claim 14, wherein said polygonal corners include square corners.

16. (Original) The mask of claim 14, wherein said polygonal corners form triangular corners.

17. (Original) The mask of claim 12, further comprising at least one opaque frame.

18. (Original) The mask of claim 12, further comprising at least one transparent frame.

19. (Original) The mask of claim 12, further comprising at least one opaque frame surrounding said partially transmissive rim.

20. (Original) The mask of claim 19, further comprising bars with ends that do not overlap each other.

21. (Original) The mask of claim 12, further comprising at least one transparent frame surrounding said partially transmissive frame.

22. (Original) The mask of claim 21, wherein said transparent frame is formed of bars with ends that do not overlap each other.

23-26. (Cancelled)

27. (Currently Amended) A microlithographic mask, comprising:
transparent material;
patterned opaque material and phase shifting material, said patterned
materials defining an opening, an opaque frame surrounding said opening, sub-
resolution bars surrounding said frame, and opaque corners located between sub-
resolution bars; and

~~The mask of claim 23, further comprising~~ an opaque frame surrounding said sub-resolution bars, and partially transmissive bars surrounding said opaque frame.

28-39. (Cancelled)

40. (Currently Amended) A method of making a multi-tone microlithographic mask, said method comprising:
providing sets of dimension data representative of mask patterns;
for each set of dimension data, calculating feature dimension data as a function of optical conditions; and
for a desired optical condition, identifying the sets of dimension data that have feature dimension data within desired limits; and
wherein said method further comprises the step of selecting the one set of dimension data that achieves the smallest change in critical dimension between a zero defocus condition and a maximum considered defocus condition; and
wherein said dimension data includes the widths of transparent openings in said patterns; and
~~The method of claim 39, wherein said dimension data includes sub-resolution dimensions of opaque features in said patterns.~~

41. (Original) The method of claim 40, wherein said dimension data includes dimensions of partially transmissive phase shifting features in said patterns.

42. (Original) The method of claim 41, wherein said limits include a critical dimension for an exposed feature.

43. (Original) The method of claim 42, wherein said limits operate to exclude side-lobing conditions.

44. (Original) The method of claim 43, further comprising the step of forming patterned layers of attenuating phase shifting material and light-obstructing material in accordance with said one set of dimension data.

45. (Original) The method of claim 44, wherein said light-obstructing material includes opaque material.

46. (Original) The method of claim 44, wherein said light-obstructing material includes partially transmissive material.

47 and 48. (Canceled)